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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/568,942

12/27/2006

Maryline Helard

F40.12-0038

7612

27367 7590 07/01/2009  
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EXAMINER

NEFF, MICHAEL R

ART UNIT

PAPER NUMBER

2611

MAIL DATE

DELIVERY MODE

07/01/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/568,942	<b>Applicant(s)</b> HELARD ET AL.	
	<b>Examiner</b> MICHAEL R. NEFF	<b>Art Unit</b> 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 February 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 February 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/12/2006</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Figure 3, the 'Symbol Estimation' block is not numbered, and appears to be referenced as element '32' in the specification. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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Regarding claims 1, 3, 9, 17, and 18 the term 'and/or' renders the claim limitations indefinite.

Regarding claim 5, 'MMSE', 'EGC', and 'ZF' are terms that need to be defined within the claim language.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**6. Claims 1, 4, 8-13 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dabak (EP 1133071 A2, see IDS).**

Re claims 1 and 17; Dabak discloses a method and means for the decoding of a received signal comprising symbols distributed in space, time and/or frequency by a space-time or space-frequency encoding matrix (Page 6 lines 39-51), wherein the method implements a space-time decoding step and at least one iteration, each iteration comprising the following sub-steps:

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diversity pre-decoding, which is the inverse of a diversity pre-encoding carried out when said signal is emitted, delivering pre-decoded data (Page 5 lines 2-5; Page 6 lines 32-36; Figures 6a and 8);

estimation of the symbols forming said signal, from said pre-decoded data, delivering estimated symbols (Page 5 lines 4-8; Page 6 lines 32-36; Figures 6a and 8); and

diversity pre-encoding identical to said diversity pre-encoding implemented at emission, applied to said estimated symbols, to give an estimated signal (Page 6 lines 39-51; page 7 lines 1-8; figure 8), however Dabak fails to explicitly disclose where the diversity pre-encoding is applied at all iterations except for the last iteration.

However, Dabak does disclose, specifically at Page 7 lines 1-8, the ability to predetermine the number of iterations which are processed via a controlled equation. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made that the design allows for the determination of when to stop processing the iterations, allowing for the disclosure to encompass the limitation of processing all iterations except for the last through both the obvious functional capabilities of the system design as well as since it has been determined that discovering the optimum or working ranges of a system (in this case the range of iterations to be processed) involves only routine skill in the art. In re Aller, 105 USPQ 233.

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Re claim 4; Dabak discloses the method according to claim 1, and further discloses wherein said encoded symbols are emitted by means of at least two antennas, which produce different corresponding transmission channels and wherein the method of decoding takes the different corresponding transmission channels comprehensively into account (page 3 line 52 - page 4 line 1).

Re Claim 8; Dabak discloses the method according to claim 1, and further discloses wherein said pre-encoding is obtained by one of the following methods: a spread-spectrum techniques technique; and linear pre-encoding (Page 4 lines 10-12 and lines 21-26).

Re Claim 10; Dabak discloses the method according to claim 1, and further comprising a channel-decoding step, symmetrical with a channel-encoding step implemented at emission (Page 5 lines 4-8; page 6 lines 32-36; figures 6a and 8).

Re Claim 11, Dabak discloses the method according to claim 10, and further discloses wherein said channel-decoding step implements a turbo-decoding operation (Page 5 lines 4-8; page 6 lines 32-36; figures 6a and 8).

Re Claim 12, Dabak discloses the method of claim 1, and further discloses comprising at least one de-interlacing step and at least one re-interlacing step,

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corresponding to an interlacing implemented at emission (Page 5 lines 16-18; page 6 lines 8-16).

Re Claim 13, Dabak discloses the method of claim 1, and further comprising a step of improvement of a channel estimation, taking account of the estimated symbols during at least one of said iterations (Page 5, lines 9-14).

**7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dabak as applied to claim 1 above and further in view of Doyle (US Patent 5,856,980).**

Re claim 9, Dabak discloses the method according to claim 1, but fails however to explicitly disclose wherein the method implements an automatic gain control step before or after said equalization step and/or during at least one of said iterations.

This design is however disclosed by Doyle. Doyle discloses wherein an automatic gain control step before or after said equalization step and/or during at least one of said iterations (Figure 1 elements 34, 36).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the data estimation process of Dabak to include the processing of received data as discloses in Doyle in order to increase the system efficiency with regards to properly estimating the data symbols received.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL R. NEFF whose telephone number is (571)270-1848. The examiner can normally be reached on Monday - Friday 8:00am - 4:30pm EST ALT Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571)272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MICHAEL R. NEFF/  
Examiner, Art Unit 2611  
/Shuwang Liu/  
Supervisory Patent Examiner, Art Unit 2611